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FRUIT AND VEGETABLE DISEASES ON THE CHICAGO MARKET IN 1935

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FRUIT AND VEGETABLE DISEASES ON THE CHICAGO MARKET IN 1935

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Plant Disease Reporter
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These notes and data represent material collected by the writer from personal observations on the condition of fresh fruits and vegetables as they arrived on the Chicago market, and information abstracted from over 2,000 certificates issued by the Inspection Service of the Fruit and Vegetable Division of the Bureau of Agricultural Economics in Chicago. Diagnoses of the diseases listed were either made by the writer or were made under his supervision in collaboration with Mr. E. E. Conklin, Regional Supervisor of Federal Inspection.

During the year, 115,408 cars of fresh fruit and vegetables arrived on the Chicago market. Of this number, 67,343 cars were unloaded and consumed in the Chicago area, and the remaining 48,065 cars were diverted to other cities. Only a small fraction of the total number of cars of fruits and vegetables were inspected, consequently no attempt is made to list all of the diseases present or to estimate the monetary losses sustained. Most of the diseases mentioned are thought to be of general interest and representative of the products inspected. However, rare and unusual diseases are listed when found, either on new hosts or on common crops from new regions.

Crops are listed alphabetically by common names.

APPLES:

In apples from all regions blue mold rot (Penicillium expansum) is by far the most common, and usually the most serious, cause of decay. Even under the best of handling conditions there are enough mechanical wounds and punctures, open lenticels, or areas injured by chemical means to open the way for this ever-present fungus. As a rule, the percentage of decay caused by blue mold is not high, most inspections showing 2 to 5 percent, with an occasional car showing as high as 12 percent of affected fruit. In exceptional instances, such as Idaho Jonathans shipped during October, blue mold rot was found affecting as high as 50 percent of the apples in some lots, and in several cars the average decay ran as high as 15 to 30 percent, the high percentage in these cars being associated with serious chemical injury as a result of washing. For example, a car of apples showing 18 percent blue mold rot also showed 70 percent severe chemical injury.

Chemical injury probably ranked second among the factors affecting the marketability of the 1935 crop. The injuries most common were bleaching by acids and burning by arsenicals, the latter being especially prominent about the calyx. In some instances checking and shriveling, characteristic of excessive heat in washing solutions, was evident. However, in the heavy shipping regions of Washington and Oregon the majority of the crop was washed and marketed without much injury due to the washing processes. The amount of chemical injury in apples from these regions, when found at all, was usually less than 2 percent.

Internal breakdown was found in apples of large size and advanced maturity in stock from many regions, but usually not more than 2 to 5 percent showed this trouble.

Bull's-eye rot (Gloeosporium perennans) was found in a few cars of Yellow Newtown apples from Washington and Oregon when inspected here in April. Decay of this type was noted in one car ranging to as high as 16 percent in some boxes, the average for the car being 6 percent.

Physiological troubles, such as scald, soft scald, water-core and bitter-pit were of slight importance except in occasional lots.

Gray mold rot (Botrytis spp.) was noted in one car of Oregon apples, but was of little commercial significance.

An unusual soft brown watery decay about the calyx and extending inward around the core of some Washington Winesap apples was of special interest. A Sporotrichum was isolated from several specimens showing this decay.

Pansy-spot (Thrip injury) was found on a few Colorado apples of the McIntosh variety.

Pink mold rot (Cephalothecium roseum), following scab, was found seriously affecting a few lots of Michigan apples.

Several cars of West Virginia Romes, taken from storage in January, were found with one-eighth-to one-half-inch brown to black spots about the lenticels. Both Alternaria and Cladosporium were repeatedly isolated from such areas.

ASPARAGUS:

The asparagus received on the Chicago market arrived in very good condition. Bacterial soft rot (Bacillus spp.), affecting about 1 or 2 percent of the stock, was noted in a few lots. Some crates of asparagus from Imperial Valley in California showed a slight amount of moldy tips, caused by a species of Fusarium.

AVOCADO:

The avocados received on the market are generally free from decay, but occasionally Rhizopus rot and anthracnose (Colletotrichum gloeosporioides) cause some trouble. In April several boxes of California avocados of the Fuerte variety showed the above types of decay, ranging from 5 to 35 percent.

BEANS:

Watery soft rot (Sclerotinia sclerotiorum) is usually the most serious decay of green beans on the market. It was found in beans from Louisiana, Texas, California, and New Jersey. While this decay usually ranges between 2 and 10 percent, occasionally a lot showed as much as 50 percent of the beans affected.

Bacterial blight (Bacterium phaseoli and B. medicaginis phaseolicola) to the extent of 1 to 5 percent was noted in a few lots of Texas beans. The blight from this region appears to be becoming more and more of the halo type.

Russetting and scarring are among the most important marketing factors.

Anthracnose (Colletotrichum lindemuthianum) caused a little trouble in green beans from Mississippi. Soil rot (Rhizoctonia solani) was also found in beans from Mississippi as well as from Louisiana.

Bacterial soft rot (Bacillus spp.) and rhizopus rot (Rhizopus spp.) were found affecting beans from all regions. These diseases are common in stock showing excessive mechanical injury and in lots that become too warm during transit.

BEETS:

Bacterial soft rot of the tops of bunch beets is about the only disease of commercial importance. There is seldom any decay of the roots.

BROCCOLI:

This relatively new vegetable has, so far, shown little decay in transit or on the market. Bacterial soft rot (Bacillus spp.) in bruised stems and flower heads sometimes occurs to a slight extent.

CABBAGE:

During February, Texas cabbage on the Chicago market showed considerable damage from bacterial soft rot (Bacillus spp.). Some cars showed 30 percent of the heads having decay in one to four outer leaves. Black leaf spot (Alternaria sp.) also blemished the outer leaves of several car lots.

Bacterial soft rot was also the most important decay in cabbage from California, Florida, Alabama, New York, and Wisconsin, but generally did not run higher than 5 to 10 percent. In one exceptional instance a lot of Alabama cabbage showed a range of 20 to 100 percent, an average of 50 percent of the heads showing this decay following bruises on the outer leaves and at the base of the stem.

Black leaf spot (Alternaria sp.) and black leaf speck (non-parasitic) were both prevalent in California cabbage marketed during March and April. California cabbage marketed during February showed a great deal of blemishing by ring-spot (Mycosphaerella brassicicola).

Black rot (Bacterium campestre) and an associated bacterial soft rot at the stump caused much trouble in Mississippi cabbage shipped during May.

Peronospora parasitica was found causing a grayish-black discoloration of the pith regions of occasional heads of Wisconsin storage cabbage marketed in February.

CANTALOUP:

A slight amount of Fusarium rot was found in cantaloups from most regions. This decay usually is found at the stem end or blossom end of the fruit.

Geotrichum sp. was found causing a brown watery decay about the blossom and stem ends of one lot of California cantaloups marketed in June. The writer had not observed this fungus causing decay in cantaloups previously.

CARROTS:

As now packed and refrigerated, bunch carrots show little decay on arrival at market. There is an occasional lot that has a small percentage of bacterial soft rot, largely due to heating. Watery soft rot (Sclerotinia sclerotiorum) and gray mold rot (Botrytis), which sometimes cause serious decay during transit and storage, were not conspicuous on the Chicago market.

CAULIFLOWER:

Bacterial soft rot, following mechanical injury to the flower head, is usually the most important disease of this crop on the market. Occasionally a somewhat similar decay, induced by Alternaria brassicae, affects some lots of cauliflower during transit and marketing, but this trouble was not of great significance during the year. Such blemishes as yellowing of the jacket leaves and spreading and riceyness of the heads are usually among the most important marketing factors.

CELERY:

Watery soft rot (Sclerotinia sclerotiorum) and bacterial soft rot caused most serious decay in celery from all regions. Many lots noted showed 3 to 25 percent watery soft rot, and one exceptional car had 75 percent of the celery bunches affected by this disease.

Neither late blight (Septoria spp.) nor early blight (Cercospora apii) were of great consequence except in one interesting case, when a lot of California celery showed 25 to 75 percent bacterial soft rot in the leaves and top branches, generally following late blight.

Cracked stem (physiological) was extremely damaging in many cars of Florida celery shipped during March. At one time three car loads were rejected on account of this serious blemish. Brown stem also caused much trouble in a few cars of Florida celery shipped during April.

CHICORY:

Brown and black discolorations of the margins of the heart leaves caused most serious trouble to this product. In some lots bacterial soft rot followed in the discolored tissues. No fungous decays were noted.

CORN:

Decay in green corn on the market is usually limited to bacterial soft rots following worm injury. This decay was present in several lots of Alabama and Texas stock.

CRANBERRIES:

New Jersey, Massachusetts, and Wisconsin berries showed from 1 to 4 percent fungous rots.

CUCUMBER:

Bacterial rot (Bacterium lachrymans) was prevalent in cucumbers from Cuba, Florida, Missouri, and Pennsylvania. In a few lots the decay ranged to as high as 25 percent.

Cottony leak (Pythium spp.) was noted in May, affecting Texas stock to the extent of 3 percent in a few lots.

Bacterial soft rot (Bacillus spp.) and Rhizopus rot are among the most common diseases of cucumber on the market, and these are generally present in stock from all regions.

Anthracnose (Colletotrichum lagenarium) was not of serious consequence on this market.

Such defects as shriveled ends and yellowing caused greatest depreciation in market value.

EGGPLANT:

Phomopsis fruit rot (Phomopsis vexans) is the only serious disease usually affecting this crop. This decay was found in various stages in stock from Florida and Cuba. In one instance decay ranged to 75 percent of the lot. The usual range of decay is around 5 to 10 percent when it is present at all in a given load.

GARLIC:

The most common decays of garlic are induced by a species of blue mold (Penicillium) and black mold (Aspergillus niger). The usual range of decay caused by these molds is about 2 percent. Frequently, in storage lots that have been allowed to become moist or heated, the decay may range from 25 to 50 percent of the lot.

GRAPES:

Blue mold rot (Penicillium spp.) and gray mold rot (Botrytis spp.) are the most common decays of grapes. In California grapes marketed during September and October many lots were found showing 2 to 10 percent decay by these diseases. California grapes in storage, marketed in January, frequently showed some damage by sodium bisulphite in the sawdust.

GRAPEFRUIT:

As a rule, grapefruit and other citrus fruit arriving on the market show little decay. Blemishes due to scarring, storage spotting, or pox are among the most serious marketing factors.

Stem-end rot due to Diplodia was found in high percentages in many cars of Texas grapefruit during October and November. For example, one car showed a range in decay of from 5 percent in some boxes to 50 percent in others, average for the load, 22 percent. In November and December several cars showed some anthracnose stem-end rot (Colletotrichum gloeosporioides).

Stem-end rot (Diplodia and Phomopsis) in Florida stock, when found, generally showed not more than 3 or 4 percent.

Blue mold rot (Penicillium spp.) was present, as usual, in small amounts in stock from all regions.

HONEYDEW AND HONEYBALL MELONS:

Rhizopus and Fusarium rots were the most common transit decays noted in this group of melons. These diseases occurred in some cars to the extent of 12 percent, but generally this type of decay ranged from 1 to 3 percent in most cars. One or two lots of California honeydews showed an unusual water-soaked type of decay from which Rhizoctonia bataticola was isolated. This is the first isolation of this fungus from melons that the writer has made.

LETTUCE:

Bacterial soft rot (Bacterium spp.) was by far the most common decay in lettuce from all regions. Although this disease was present in many cars, it rarely affected more than 5 percent, and in most cases it was confined to one or two outer leaves that are usually trimmed off. In some instances of evident mishandling or of poor refrigeration this decay was found affecting as much as 32 percent of the stock. Rather high percentages of bacterial soft rot were especially common in cars of lettuce showing tip-burn.

Tip-burn causes more serious loss and affects the marketability of affected stock more than any other single factor. This non-parasitic trouble often affects 50 percent or more of the lettuce from some regions during certain seasons.

Watery soft rot (Sclerotinia sclerotiorum) was of little commercial significance except in a few cars of Arizona lettuce.

Gray mold rot (Botrytis spp.) and downy mildew (Bremia lactucae) were not found causing appreciable damage this year.

Brown blight was found only in a few cars from California and Arizona. The resistant varieties of lettuce now being grown have apparently effectively controlled this disease as a market factor.

LEMON:

Blue mold and green mold (Penicillium spp.) were the only parasitic diseases found, and these were seldom present in more than 1 to 3 percent of the lemons in most lots. Occasionally a car showed a range of decay of

2 to 14 percent in various boxes, the average for one particular car being 6 percent. Physiological troubles such as "internal decline" (endoxerosis), pitting, and oil spotting generally caused more market loss than any parasitic disease.

ONION:

As in years past, bacterial soft rot (Bacterium spp.) and gray mold rot (Botrytis spp.) caused more damage to onions than any other diseases. Bacterial soft rot was unusually serious in Texas onions during May. In some instances the decay ranged to as high as 85 percent. The average decay in several cars was above 25 percent. Damp and poorly cured stock that becomes warm in transit is especially susceptible to bacterial soft rot. A Fusarium and an associated Macrosporium rot was also present in some of the Texas stock.

Gray mold rot affected appreciable percentages of onions from Michigan, Colorado, Texas, Utah, Washington, Oregon, Mississippi, and California. When present, in most instances, the range in decay was from 3 to 15 percent, averaging about 5 percent in most cars, with an exceptional lot now and then showing as high as 50 percent gray mold rot. This is the most serious storage disease throughout the year.

Next to gray mold rot, the physiological deterioration usually referred to as storage breakdown was the most serious storage trouble of onions. Unfortunately, this breakdown has many characteristics of freezing injury and it is not possible, in many instances, to distinguish between these troubles. The watery, translucent, fleshy scales frequently offer easy access to such decay-producing organisms as bacteria and Botrytis. This type of breakdown was serious in much of the Michigan and Colorado onions marketed during January and February.

ORANGE:

Most decay of any consequence in oranges received on the market was due to blue mold (Penicillium spp.). This decay was prevalent to some extent in stock from all regions, but the decay generally ranged below 5 percent. In one car blue mold rot affected 2 to 22 percent of the fruits in various boxes, the average for the load being 12 percent. This was the most serious decay of this type noted during the year. Other serious market factors were skin discoloration, scarring, and brown spotting of fruits in storage.

Gray mold (Botrytis spp.) was found in a few cars of California oranges, and in April anthracnose stem-end rot (Colletotrichum gloeosporioides) was also noted in a few lots.

PEA:

Most of the peas received on the Chicago market originate in California, Washington, Oregon, Mississippi, and Mexico. Defects consisting of scars, over-mature and poorly-filled pods were generally the most serious marketing factors. These defects ran unusually high in most cars, often reaching 40 percent, the average range being about 10 to 20 percent.

Pod-spot (Ascochyta pisi) caused relatively little damage, although it was noted in California and Oregon stock, sometimes ranging to 5 percent. Usually there are no secondary decays following this spot, so, for practical purposes, it should probably be classed as a blemish.

A slight amount of watery soft rot (Sclerotinia sclerctiorum) was found in California peas.

Gray mold rot (Botrytis spp.) was found affecting 5 to 10 percent of the peas in a few cars received from Washington.

Mosaic is becoming an important market factor in California and Oregon peas. Many cars of peas showed 5 to 25 percent of the stock conspicuously malformed.

California peas received during September and October often had severe blemishes by the Cladosporium scab. One car showed 75 percent of the stock noticeably blemished by this trouble. Lots showing 10 to 25 percent of this scab were common. Fortunately, no decay follows or is associated with this disease.

During November a few cars of California peas showed a physiological spotting of the seed-coat. The pods appeared normal in every respect, but many of the seeds within showed yellowish-brown discolored areas on the seed coat next to the pod wall. A number of isolations from such discolored tissue showed it to be sterile.

A few lots of Mississippi peas showed an appreciable percentage affected by bacterial spot (Bacterium pisi).

PEACHES:

The most serious decays of peaches were caused by brown rot (Sclerotinia fructicola) and Rhizopus rot, regardless of the point of origin of the stock. Frequently these two diseases were associated in the same car, rhizopus being especially prevalent in the warmer top layers. Brown rot was also serious in the top layers of baskets, but it was not inhibited quite so much by the lower temperatures in the bottom layers as was Rhizopus rot. The difference in temperature between the fruit at the bottom

and the top of the load usually ranged from 5 degrees to 7 degrees Fahrenheit. The usual range at the bottom was 43 to 46 degrees, at the top 48 to 50 degrees.

The most serious decay was found in a car of Georgia peaches received the last of July. This car showed 15 to 70 percent decay, with an average of 40 percent, practically all of which was brown rot. The fruit in the bottom layer baskets had a temperature of 40 degrees Fahrenheit and had 15 percent decay. The top layer baskets showed a fruit temperature of 49 degrees Fahrenheit and showed brown rot affecting 70 percent of the fruit.

PEARS:

The pears received on this market were generally in good condition as far as decay was concerned. One or 2 percent of blue mold (Penicillium spp.) was occasionally found and a slight amount of Alternaria rot was noted in a few lots. A car of Washington Anjou pears received in March showed about the highest decay noted. Many boxes in this car showed around 8 percent of blue mold and occasionally a fruit or two affected with gray mold.

Although brown rot (Sclerotinia cinerea) was not common, it was found affecting 35 to 50 percent of the pears in some boxes received from Washington in April.

Storage breakdown of Bartlett pears was severe in many lots held in cold storage.

Illinois Kieffer pears held in storage suffered much loss on account of a breakdown about the core. The external appearance of this stock was good.

PEPPERS:

As a rule, Rhizopus rot takes a rather high toll of peppers on the market. The decay caused by this organism usually averages about 5 percent.

Florida peppers received during April and May were often seriously affected by Phytophthora rot. Several cars showed a range of 5 to 45 percent, with an average of 20 percent decay. Bacterial soft rot followed in much of this diseased stock.

Bacterial spot (Bacterium vesicatorium) and gray mold rot (Botrytis spp.) were of slight consequence this year, although gray mold occurred in a few lots of storage peppers. California peppers in cold storage

frequently showed heavy losses on account of decay caused by Cladosporium and Botrytis. Some stock showed as much as 25 percent of decay in advanced stages.

Charcoal rot (Rhizoctonia bataticola) was found affecting a few peppers received in July from New Jersey.

PINEAPPLES:

Pineapples received in June from Mexico sometimes showed as high as 60 percent decay induced by bacteria, yeasts, and the various secondary fungi, following bruises and mechanical injury in fully ripe stock.

Bacteria and Rhizopus caused serious loss in several lots of Cuban pineapples received in June. One car arrived showing 75 percent of the fruits affected with Rhizopus and bacteria.

PLUMS AND PRUNES:

These products usually suffer very little decay during transit. Only a few lots were noted that showed any appreciable decay, the causal organism being, in most cases, either Rhizopus or Penicillium.

POTATOES:

Fusarium tuber rot (Fusarium spp.) caused more loss in potatoes from the important shipping sections than any other decay. Potatoes from Idaho, Michigan, Wisconsin, Minnesota, Colorado, and North Dakota showed this decay, generally ranging from 1 to 10 percent in many cars.

Jelly-end rot (mostly Fusarium) was noted causing about 5 percent decay in a few cars of Colorado and Idaho potatoes.

Hollow-heart occurred in excessive amounts in potatoes from Michigan, Minnesota, and Wisconsin. Many cars showed 5 to 15 percent, and occasional cars showed as much as 50 percent of the potatoes with hollow-heart. Other defects incident to tuber development, such as secondary growth knobs and growth cracks, also lowered the market value of this stock.

Scab (Actinomyces scabies) was of little consequence except in a few lots of Wisconsin, Michigan, and New Jersey potatoes.

Bacterial soft rot (Bacterium spp.) continues to be the most serious decay in southern grown potatoes. Mechanical injury incident to harvesting, grading, and packing this immature stock opens the way for bacterial infection, and the warm temperature favors development of the organisms during

transit and marketing. This decay is especially serious in potatoes that show sun scald.

The increasing practice of washing southern-grown potatoes has also led to serious consequences in some regions. In many lots of potatoes not properly dried before loading, the surface moisture has greatly favored the development of bacterial soft rot during transit. Washing vats that are not kept clean or not renewed with fresh water often may lead to contamination of potatoes. The development of some sterilizing wash, such as formaldehyde or borax, along with better methods of rinsing and drying the tubers before packing is highly desirable.

Tubers grown in moist soil and having enlarged lenticels frequently become infected with bacterial soft rot when loaded wet or moist.

The range of decay by bacterial soft rot varies considerably, often not reaching over 10 or 15 percent, but some lots came to attention from Florida, Alabama, and Louisiana that showed sun scald and decay ranging to 40 percent of the load.

Practically all bacterial soft rot found in northern grown potatoes follows freezing injury.

Sclerotium rot (Sclerotium rolfsii) was found in a few cars of Alabama potatoes, sometimes to the extent of 10 percent.

Late blight (Phytophthora infestans) and Alternaria tuber rots (Alternaria solani) were not of serious consequence on this market except in a few lots of Wisconsin potatoes.

Insect injuries caused relatively little trouble. A few cars of New Jersey potatoes showed wire-worm injury and a small percentage of Virginia potatoes showed tuber moth injury.

RADISHES:

The only decay of importance in radishes on the market is bacterial soft rot affecting the tops. Generally this decay is not serious, but occasionally in excessively injured or bruised tops and where high temperatures prevail the decay does become important. Some Texas and California radishes on inspection showed from 15 percent to as high as 75 percent of the leaves diseased. Although the roots are remarkably free from decay, the market value of the bunch radish is greatly influenced by the tops.

A few lots of Ohio radishes showed a small percentage of root rot induced by a species of Fusarium.

RHUBARB:

Gray mold rot (Botrytis spp.) was the only decay found in rhubarb. This trouble frequently affects 5 to 10 percent of Oregon rhubarb received on this market. Some lots showing a low percentage of decay on arrival, showed as high as 30 to 50 percent after having been held in storage for three weeks. Practically all of this infection is located at the base of the stalks.

RUTABAGAS AND TURNIPS:

The only decay of any consequence in these crops was noted in rutabagas from Canada. A few lots of this stock showed gray mold rot (Botrytis spp.) and fusarium rot (Fusarium spp.) to the extent of 3 to 5 percent.

SPINACH:

The spinach received on the Chicago market originated in Texas, California, Colorado, and Arkansas. In stock from these States bacterial soft rot was the most important disease. In most instances the decay ranged from 1 to 5 percent, but a few cars showed as high as 17 percent. Practically all bacterial soft rot originated in crushed and broken stems and leaves, or followed in yellow or brown leaf margins injured by freezing, wind-whipping or other unfavorable growing conditions.

Although downy mildew (Peronospora effusa) was present in many cars it was generally of little consequence. The yellow spots were usually inconspicuous and affected the marketability of the stock very little.

Brown and yellow discolorations, due to age and various types of injuries, were among the most important market factors.

SQUASH:

The squash received on the market is usually free from decay. The stock held in cold storage, however, sometimes shows losses on account of decay induced by species of Alternaria, Cladosporium, Fusarium, and Botrytis. The most serious loss noted was in a lot of Minnesota squash which showed 37 percent decay induced by Botrytis.

STRAWBERRIES:

There is always a great deal of variation in the decay in strawberries shipped from the various producing centers. Rhizopus soft rot generally causes as much as or more serious decay than the other diseases because it is ever-present in over-ripe berries and in berries showing

excessive mechanical injury, and in stock that has not been properly refrigerated.

Gray mold rot (Botrytis spp.) probably ranked second as a cause of decay but this was not often serious. A few lots of berries received from Idaho and Michigan showed 5 to 15 percent decay by gray mold rot.

Leather rot (Phytophthora spp.) was found affecting berries from Tennessee and Kentucky, the usual range of decay being between 2 and 15 percent. Sclerotinia rot was also found in small amounts in Kentucky strawberries.

SWEET POTATOES:

Rhizopus soft rot was the principal decay noted in shipments from all districts. Generally this decay, when present, affected less than 5 percent of the stock, but occasionally it ranged to 25 percent. Java black rot (Diplodia tubericola) and foot rot (Plenodomus destruens) were found causing a small amount of decay in several lots of sweet potatoes from Louisiana.

Blue mold rot (Penicillium spp.) also caused serious decay in storage lots of Porto Rican yams from Louisiana that were marketed in July.

Growth cracks, cuts, rodent injury and weevil injury were common defects in the Kentucky and Tennessee stock. These defects sometimes ranged to as high as 40 percent in some lots.

TOMATOES:

Among the pathogens common to all the tomato producing regions species of Alternaria and bacteria took the highest toll throughout the year. Alternaria rot and bacterial soft rot affected 10 to 28 percent of the tomatoes in several cars of Florida stock received during January. Alternaria rot alone was found affecting from 2 to 5 percent of the tomatoes received from Cuba, Mexico, and California. Most Alternaria rot in California tomatoes occurs in the late fall and early winter crop. In some cars the stem-end decay induced by Alternaria becomes quite serious during the transit period, and causes extremely heavy losses in stock that is held on track or in ripening rooms. It is not uncommon to find tomatoes showing only 5 to 10 percent Alternaria rot on arrival show as much as 50 percent decay after being held a week for ripening.

Pleospora rot (Pleospora lycopersici) was found occasionally in a few lots of California tomatoes received during November.

Anthracnose (Colletotrichum phomoides) was found in a few tomatoes received from Cuba but it was not of serious commercial importance.

Rhizopus rot was found causing 1 to 5 percent decay in many cars of tomatoes, but, generally speaking, it was not severe except in cars showing one-half or more of the tomatoes ripe on arrival. Rhizopus rot is also frequently a cause of serious decay in tomatoes held for ripening. The warm temperature and high humidity maintained in the ripening rooms favor its rapid development. This decay is often associated with bacterial soft rot in ripe, bruised, or roughly handled stock in cars that have been allowed to become overly warm.

Phoma rot (Phoma destructiva) caused heavy losses in many cars of Florida tomatoes shipped during April and May. A number of cars showed a range of 3 to 20 percent, with an average of about 8 percent Phoma rot on arrival. Stock showing only small percentages on arrival sometimes showed as high as 60 percent affected tomatoes after being held in ripening rooms for a few days. Along with the usual stem-end infection, there was an unusual amount of infection through small wounds and scars over the shoulders and sides of the fruit. Phoma rot also caused a slight amount of damage to Mississippi tomatoes shipped in June.

Late blight tomato rot (Phytophthora infestans) was a marketing factor in the October and November California crop of tomatoes. Many cars showed around 5 percent late blight rot on arrival. The most serious decay noted was in a car inspected the last of October, which showed a range of decay from 3 to 50 percent, the average for the load being 20 percent.

The varieties of tomatoes now grown in most commercial regions are apparently very resistant to nail-head spot (Alternaria tomato). Only a few tomatoes grown in Missouri were found to show this blemish.

One lot of Texas tomatoes was found showing sulphur-dioxide injury. These fruits were injured by the burning of sulphur in the storage room in an attempt to control development of decay.

WATERMELON:

Friction bruises and scarring due to contact with floors and side walls in cars with improper bedding cause more damage to watermelons in transit than any other factor. In many instances, the wounds offer entrance to bacteria of the soft rot type. Some cars noted showed as high as 10 percent bacterial soft rot following bruises. One car of Georgia melons showed from 25 to 40 percent decaying with bacterial soft rot following in contact bruises.

Only a few cars of Florida and Georgia melons showed any appreciable stem-end rot (Diplodia tubericola) and in most lots anthracnose (Colletotrichum lagenarium) was of no consequence.